

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

**Present Application:**

Applicants : David C. DeCoster et al.  
Title : METHODS AND DEVICES FOR CONTROLLING THE  
REACTION RATE AND/OR REACTIVITY OF HYDROCARBON  
TO AN INTERMEDIATE OXIDATION PRODUCT BY  
ADJUSTING THE OXIDANT CONSUMPTION RATE  
Docket No. : 900105.413USD1  
Date : April 30, 2001

**Prior Application:**

Examiner : Taylor Victor Oh  
Art Unit : 1623  
Application No. : 09/253,172

Box Patent Application  
Commissioner for Patents  
Washington, DC 20231

**PRELIMINARY AMENDMENT**

Commissioner for Patents:

Please amend the above-identified application as follows:

**In the Title:**

Please replace the title with the following rewritten title:

DEVICES FOR CONTROLLING THE REACTION RATE AND/OR  
REACTIVITY OF HYDROCARBON TO AN INTERMEDIATE OXIDATION PRODUCT BY  
ADJUSTING THE OXIDANT CONSUMPTION RATE

In the Specification:

Please amend the specification by inserting a new section before the "Technical Field" as follows:

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a divisional of pending United States Patent Application No. 09/253,172 (now allowed), filed February 19, 1999; which claims the benefit under 35 U.S.C. §§ 120 or 365(c) of PCT International Application No. PCT/US97/12944, having an international filing date of July 23, 1997; U.S. Patent No. 5,801,273, issued September 1, 1998; U.S. Patent Application No. 08/859,985, filed May 21, 1997 (now abandoned); and further claims the priority benefit of U.S. Provisional Application No. 60/025,374 and U.S. Provisional Application No. 60/025,374, filed September 3, 1996; and U.S. Provisional Application No. 60/024,263, filed August 21, 1996, which applications are incorporated herein by reference in their entirety.

In the Claims:

Please cancel claims 1-9.

Please amend claims 15-19 to read as follows:

15. (Amended) A device as defined in claim 11, further comprising one or more of:

temperature monitoring means for monitoring the temperature in the reaction chamber;

solvent feeding means connected to the reaction chamber for feeding a predetermined amount or rate of a solvent into said reaction chamber;

catalyst feeding means connected to the reaction chamber for feeding a predetermined amount or rate of a catalyst into said reaction chamber;

initiator or promoter feeding means connected to the reaction chamber for feeding a predetermined amount or rate of a promoter into said reaction chamber; and

recycle feeding means for recycling matter after at least partial removal of reaction products.

16. (Amended) A device as defined in claim 15 wherein the controller is connected to the at least one of the temperature monitoring means, the oxidant feeding means, the hydrocarbon feeding means, the solvent feeding means, the catalyst feeding means, the recycle feeding means, and the initiator or promoter feeding means; the controller being programmed to adjust at least one of said temperature monitoring means, oxidant feeding means, hydrocarbon feeding means, solvent feeding means, catalyst feeding means, and initiator or promoter feeding means, in a manner to either give an indication to an operator, if the reactivity is found to be outside the predetermined range, or to adjust the oxidant consumption rate so as to bring back and maintain said reactivity within said desired range.

17. (Amended) A device as defined in claim 15 wherein at least two of said oxidant feeding means, hydrocarbon feeding means, solvent feeding means, catalyst feeding means, and promoter feeding means are combined to one combination means.

18. (Amended) A device as defined in 15 wherein the reaction chamber is at least part of an atomization reactor.

19. (Amended) A device as defined in claim 15 wherein the reaction chamber is at least part of a stirred-tank reactor.

Please add claims 20-22 as follows:

20. (New) A device as defined in claim 12, further comprising one or more of:

temperature monitoring means for monitoring the temperature in the reaction chamber;

solvent feeding means connected to the reaction chamber for feeding a predetermined amount or rate of a solvent into said reaction chamber;

catalyst feeding means connected to the reaction chamber for feeding a predetermined amount or rate of a catalyst into said reaction chamber;

initiator or promoter feeding means connected to the reaction chamber for feeding a predetermined amount or rate of a promoter into said reaction chamber; and

recycle feeding means for recycling matter after at least partial removal of reaction products, and

wherein the controller is connected to the at least one of the temperature monitoring means, the oxidant feeding means, the hydrocarbon feeding means, the solvent feeding means, the catalyst feeding means, the recycle feeding means, and the initiator or promoter feeding means; the controller being programmed to adjust at least one of said temperature monitoring means, oxidant feeding means, hydrocarbon feeding means, solvent feeding means, catalyst feeding means, and initiator or promoter feeding means, in a manner to either give an indication to an operator, if the reactivity is found to be outside the predetermined range, or to adjust the oxidant consumption rate so as to bring back and maintain said reactivity within said desired range.

21. (New) A device as defined in claim 13, further comprising one or more of:

temperature monitoring means for monitoring the temperature in the reaction chamber;

solvent feeding means connected to the reaction chamber for feeding a predetermined amount or rate of a solvent into said reaction chamber;

catalyst feeding means connected to the reaction chamber for feeding a predetermined amount or rate of a catalyst into said reaction chamber;

initiator or promoter feeding means connected to the reaction chamber for feeding a predetermined amount or rate of a promoter into said reaction chamber; and

recycle feeding means for recycling matter after at least partial removal of reaction products, and

wherein the controller is connected to the at least one of the temperature monitoring means, the oxidant feeding means, the hydrocarbon feeding means, the solvent feeding means, the catalyst feeding means, the recycle feeding means, and the initiator or promoter feeding means; the controller being programmed to adjust at least one of said temperature monitoring means, oxidant feeding means, hydrocarbon feeding means, solvent feeding means, catalyst feeding means, and initiator or promoter feeding means, in a manner to either give an indication to an operator, if the reactivity is found to be outside the predetermined range, or to adjust the oxidant consumption rate so as to bring back and maintain said reactivity within said desired range.

22. (New) A device as defined in claim 14, further comprising one or more of:

temperature monitoring means for monitoring the temperature in the reaction chamber;

solvent feeding means connected to the reaction chamber for feeding a predetermined amount or rate of a solvent into said reaction chamber;

catalyst feeding means connected to the reaction chamber for feeding a predetermined amount or rate of a catalyst into said reaction chamber;

initiator or promoter feeding means connected to the reaction chamber for feeding a predetermined amount or rate of a promoter into said reaction chamber; and

recycle feeding means for recycling matter after at least partial removal of reaction products, and

wherein the controller is connected to the at least one of the temperature monitoring means, the oxidant feeding means, the hydrocarbon feeding means, the solvent feeding means, the catalyst feeding means, the recycle feeding means, and the initiator or promoter feeding means; the controller being programmed to adjust at least one of said temperature monitoring means, oxidant feeding means, hydrocarbon feeding means, solvent feeding means, catalyst feeding means, and initiator or promoter feeding means, in a manner to either give an indication to an operator, if the reactivity is found to be outside the predetermined

range, or to adjust the oxidant consumption rate so as to bring back and maintain said reactivity within said desired range.

In the Abstract of the Disclosure:

Please replace the title of the Abstract with the following rewritten title:

DEVICES FOR CONTROLLING THE REACTION RATE AND/OR  
REACTIVITY OF HYDROCARBON TO AN INTERMEDIATE OXIDATION PRODUCT BY  
ADJUSTING THE OXIDANT CONSUMPTION RATE

REMARKS

Claims 1-19 were pending in subject application. Claims 1-9 have been canceled. Claims 15-19 have been amended, and claims 20-22 have been added. Claims 15-19 were amended solely to convert multiple dependent claim format into single dependent claim format, where claims 20-22 have been added in order to add claims that were formerly part of the multiple dependent claims 15-19. Accordingly, the amendment to the claims does not add new matter.

The present application is a divisional of U.S. Patent Application No. 09/253,172, filed February 19, 1999 (now allowed) ("the parent application"). This divisional application is filed in response to the Restriction Requirement dated June 7, 2000, in the parent application. In the Restriction Requirement the Examiner required an election between two groups of claims:

- Group I – Claims 1-3, 6-9 and 20-36, drawn to a method of controlling the oxidation of a hydrocarbon to an intermediate oxidation product, all classified in class 562, subclass 413.
- Group II – Claims 10-19 and 37-39, drawn to a device for controlling the oxidation of a hydrocarbon to an intermediate oxidation product, all classified in class 422, subclass 110.

In response to the Restriction Requirement in the parent application, applicants elected to prosecute the claims of Group I, i.e., claims 1-3, 6-9 and 20-36 directed to a method of controlling the oxidation of a hydrocarbon to an intermediate oxidation product.

In the current divisional application, claims 10-19 and 20-22 are directed to the subject matter of the non-elected claims of Group II, i.e., to a device for controlling the oxidation of a hydrocarbon to an intermediate oxidation product. The application has been amended to add a section entitled "Cross-Reference to Related Applications", which indicates that the present application is a divisional application of now-allowed USAN 09/253,172.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current preliminary amendment. The attached page is captioned "**VERSION WITH MARKINGS TO SHOW CHANGES MADE**".

Entry of the Preliminary Amendment, and an early examination of the above-identified divisional application are respectfully requested.

Respectfully submitted,

Seed Intellectual Property Law Group PLLC



David W. Parker

Registration No. 37,414

DWP:scr

Attachment:

**VERSION WITH MARKINGS TO SHOW CHANGES MADE**

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Seattle, Washington 98104-7092  
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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Title:

Please replace the title with the following rewritten title:

-- ~~METHODS AND~~ DEVICES FOR CONTROLLING THE REACTION RATE  
AND/OR REACTIVITY OF HYDROCARBON TO AN INTERMEDIATE OXIDATION  
PRODUCT BY ADJUSTING THE OXIDANT CONSUMPTION RATE --

In the Specification:

Amend the specification by inserting a new section before the "Technical Field"  
as follows:

-- CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a divisional of pending United States Patent Application No. 09/253,172 (now allowed), filed February 19, 1999; which claims the benefit under 35 U.S.C. §§ 120 or 365(c) of PCT International Application No. PCT/US97/12944, having an international filing date of July 23, 1997; U.S. Patent No. 5,801,273, issued September 1, 1998; U.S. Patent Application No. 08/859,985, filed May 21, 1997 (now abandoned); and further claims the priority benefit of U.S. Provisional Application No. 60/025,374 and U.S. Provisional Application No. 60/025,374, filed September 3, 1996; and U.S. Provisional Application No. 60/024,263, filed August 21, 1996, which applications are incorporated herein by reference in their entirety. --

In the Claims:

Claims 1-9 have been canceled.

Claims 15-19 have been amended as follows:

15. (Amended) A device as defined in claim 11, ~~12-13, or 14~~, further comprising one or more of:

temperature monitoring means for monitoring the temperature in the reaction chamber;



solvent feeding means connected to the reaction chamber for feeding a predetermined amount or rate of a solvent into said reaction chamber;

catalyst feeding means connected to the reaction chamber for feeding a predetermined amount or rate of a catalyst into said reaction chamber;

initiator or promoter feeding means connected to the reaction chamber for feeding a predetermined amount or rate of a promoter into said reaction chamber; and

recycle feeding means for recycling matter after at least partial removal of reaction products.

16. (Amended) A device as defined in claim 15 wherein the controller is connected to the at least one of the temperature monitoring means, the oxidant feeding means, the hydrocarbon feeding means, the solvent feeding means, the catalyst feeding means, the recycle feeding means, and the initiator or promoter feeding means; the controller being programmed to adjust at least one of said temperature monitoring means, oxidant feeding means, hydrocarbon feeding means, solvent feeding means, catalyst feeding means, and initiator or promoter feeding means, in a manner to either give an indication to an operator, if the ~~reaction rate or the reactivity or both~~ is found to be outside the predetermined range, or to adjust the oxidant consumption rate so as to bring back and maintain said ~~reaction rate or said reactivity or both~~ within said desired range.

17. (Amended) A device as defined in claim 15 ~~or 16~~ wherein at least two of said oxidant feeding means, hydrocarbon feeding means, solvent feeding means, catalyst feeding means, and promoter feeding means are combined to one combination means.

18. (Amended) A device as defined in claim ~~10, 11, 12, 13, 14, 15, 16, or 17~~ wherein the reaction chamber is at least part of an atomization reactor.

19. (Amended) A device as defined in claim ~~10, 11, 12, 13, 14, 15, 16, or 17~~ wherein the reaction chamber is at least part of a stirred-tank reactor.

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